DESIGN AND FABRICATION OF FOLDABLE FOOTBALL GOAL

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SUPERVISOR'S DECLARATION

I hereby declare that I have read this project report and in my opinion this project report is sufficient in terms of scope and quality for the award of Diploma in Mechanical Engineering

Signature :
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Date :

STUDENT'S DECLARATION

I hereby declare that the work in this report is my own except for quotations and summaries which have been duly acknowledged. The report has not been accepted for any diploma and is not concurrently submitted for award of other diploma.

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ABSTRACT

This report presents about football goal that always been used especially in field and soccer court. The usage of a goal is as the posts to shoot the ball trough it. All the ideas of the goal designs and materials are based on the student creativity. The selection for the material that suitable to be used for the foldable goal frame is a material which light in weight, long lasting life and can endure high load. So, the materials that are proposed in this project are mild steel and hinges. In this report will focus more on fabrication of the foldable football goal by using the mechanical machine like welding and grinding machine.

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ABSTRAK

Laporan ini membentangkan tentang goal yang sering kali digunakan terutamanya di padang permainan mahupun di gelanggang bola sepak. Gol merupakan suatu alat yang digunakan sebagai tempat untuk menjaringkan bola. Kesemua idea mereka bentuk dan bahan yang sesuai untuk menjalankan projek ini ialah bergantuk pada kreativiti pelajar. Pemilihan bahan yang sesuai untuk digunakan pada rangka gol boleh lipat ini merupakan bahan yang mempunyai berat yang ringan, jangka hayat yang tahan lama dan boleh menahan beban yang berat. Maka, bahan yang dicadangkan untuk membuat alatan ini merupakan ‘mild steel’ dan engsel. Dalam laporan juga ini akan lebih memfokuskan kepada pembuatan gol boleh lipat yang menggunakan mesin mekanikal seperti mesin kimpal dan mesin canai.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

There will include about the problems statement of this project in this chapter. Then, it will be followed by the current design of the project, solution of the problem statements, objective of the project, and also including scopes of the project.

1.2 Project Background

Football is not only the number one sport in Malaysia but also in this entire world. The other game or sports like football are street soccer and futsal. This sport mostly needed the same equipments when we want to play it. One of the most important equipment that needed in these games is the goal. It is use as the place or target to shoot the ball though it. Sometimes we can see the players make the goal with the, slippers, stone, cone, and so on. Besides, they also use the mini goal. Mostly the goal is not portable and quite hard to carry. The portable goal must be easy to carry and easy to keep. We can found lots of mini goal that use in football game but usually it is fixed. It is required much time to move or store after it have been used. So, to make it easy to move and restore, the portable goal must have the adjustable frame to make it easy to move and keep. In other word is the body of the goal can be fold (foldable).Foldable goal means that the model or the prototype of the truss frame can be fold that can make the goal easily to carry and store it.

The project is to fabricate foldable truss frame that can make it easy to be store. The structure of this foldable goal must be robust, stable, and light. The prototype is design based on this problem and to improve the design that available. The suitable part will be choosing to make it foldable.

1.3 Problem Statement

A lot of current soccer goal is quite hard to carry or remove because it body frame not foldable and need some space to store it. Mostly all of the designs are fixed and locate permanently that cannot remove to anywhere. In addition, the goal that have been designed was unstable that can exposed the injuries to the players. One innovation is needed for those who love to play soccer with assorted atmospheres. It is desirable to have football goal that light in weight and possible to own by every single household.

1.4 Market design

Nowadays, we can see some mini goals that have been use as target to shoot the ball. Even the designs that available in the market are different but almost all of the designs are single seated and fixed. As the consequences, it is quite hard to carry anywhere and needed a little bit space to store it because of the size factor. This below figure is the example current of the mini goal design:

Figure 1.1: Training Goal Post

Figure 1.2: General Football Goal Post

1.5 Problem Solutions

There are some specifications that have been considered to solve this problem. The specifications are:

1.5.1 Size
1.5.2 Light weight
1.5.3 Foldable frame
1.5.4 Good stability
1.5.5 Tough body/frame

1.6 Project Objectives

There are three main objectives to achieve in this research which are:

1.6.1 To design and fabricate a foldable goal prototype.

1.6.2 Have a good stability, robust truss, and stable.

1.6.3 Easy to carry and keep.

1.7 Project Scopes

The ability to contribute the scope in designing the product is important to make it success. It can be the benchmarking for the development of the product. To accomplish the objectives, there are three scopes project which are:

1.7.1 Sketch and design a new football goal to make it easy to store and carry.

1.7.2 Fabricate the prototype that has the limit size at 960mmx350mmx 570mm.

1.7.3 Fabricate a foldable goal using various mechanical processes (welding, cutting, and grinding).

1.7.4 Auto-CAD or Solidwork software's is used in design process.

1.8 Project Flow

As the chart shown below, the start started with finding the problems that was face by the goal consumers. For the diagram as shown as below, the project starts with literature review and research about the current design of the goal trough the internet and from view at the field and football court. After doing the literature study, the problems statement had been found. The next step is to find the project objectives as the way to solve the problems and lastly determine the project scopes.

After gathering all the relevant information, the project undergoes design process. In this step, from the knowledge gather from the review is use to make a sketch design that suitable for the project. There are four concepts selections have been designed. The evaluation concepts have been done to get the final concept. Concept D has be the final concept after the evaluation process.

The next step is to list down the material needed to fabricate the goal. There are only two materials needed in this fabrication process which are hollow mild steel and the hinges to allow the goal can be fold.

Before the making the joining process, the steel must be measured first according to the design. After all the parts have been cut, the project proceeds to next step that is joining process. In this step, the MIG welding have been chosen to join the part.

After finish the joining process, the product will be test whether it fulfills the requirement such as can be functioned, safety, strength and it stability. If the product cannot be function well or having others problems, it will turn back to the modification process.

The finishing process will be done on the product after there is no problem on it. The goal will be coloured with paint. The last process is the project must be presented to the panels and continue with the project report submission.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The story in this chapter will tell about the history about the football goal post and its type. Besides that, it also includes the material that has been used to fabricate the goal post and its process.

2.2 Goal (Sport)

Goal refers to a method of scoring in many sports. It can also refer to the physical structure or area of the playing surface in which a score is made. The structure of a goal can vary widely from sport to sport. In sports where goals are the sole method of scoring, the goal is often a rectangle structure set in the center of each end of the playing surface. Frequently, there is a net to catch the ball or puck as it is sent into the goal. Some sports do not require the net within their rules while others do. Other sports, especially those that use field goals, have very different structures. Most have a variation on the theme of goal posts and crossbars (frequently an elevated crossbar supporting goal posts with the object being to have the ball pass over the crossbar, rather than under it.)

2.3 Method of Scoring

In some sports, the goal is the sole method of scoring, and in these sports, the final score is expressed in "goals" where the winner is the team that accumulates the larger number of goals in the given time.

In other sports, a goal is the primary, but not the sole method of scoring. In these sports, the goal is worth a set number of points, and there is another method of scoring which scores fewer points (often one point). In these sports, the score is expressed as the number of goals plus the number of alternate scores and the combined total of points with the winner being decided on total points. For example, an Australian Rules Football the score may be expressed as follows: Sydney 10-4-64 Brisbane 9-12-66.

In this example Sydney scored 10 goals (at six points each) and 4 behinds (one point each) for a total of 64 points. Brisbane scored 9 goals and 12 behinds for a total of 66 points. Despite having fewer goals, Brisbane won the game.

Other sports use a Field Goal as one of several methods of scoring. The field goal can be a primary or secondary score and is used when there are several possible scoring methods. In these sports, the object of the game is to score a greater number of total points than the opponent. Scores are expressed solely as numbers of points.

2.4 Goal Post Structure

In many games, at each end of the field of play, there are two vertical posts (or uprights) supporting a horizontal crossbar. In some games, such as Association Football or Hockey, the object is to pass the ball between the posts below the crossbar, while in others, such as those based on Rugby, the ball must pass over the crossbar instead. In Gaelic football and Hurling, in which the goalposts are similar to those used in rugby, the ball can be kicked either under the crossbar for a goal, or over the crossbar through the posts for a point. There are other variants too.

The vertical supports are usually called Goal Posts and the horizontal top is usually called the Crossbar. Scores in these games normally require that the ball or puck be sent between the posts, under the crossbar and completely behind the goal line. The space under the crossbar and between the goal posts is colloquially referred to as the goal mouth.

In Australian Rules Football, there is no crossbar but 4 uprights instead. In Netball, a single post at each end of the court supports a horizontal hoop that the ball must fall through. While in Basketball, where the hoop and associated backboard was originally supported on a post, the posts themselves have been done away with in most cases, and the hoop and backboard now are suspended over the court from a stadium wall or ceiling.

2.5 Association Football

In association football, the goal is the sole method of scoring. It is also the term used for the scoring structure. To score a goal, the ball should pass totally over the goal line between the goal posts and under the crossbar and no rules may be violated (such as touching the ball with the hand or arm).

The goal structure is defined as a frame 24 feet (7.32 m) wide by 8 feet (2.44 m) tall. Most commonly a net is used both to catch the ball and indicate that a goal has indeed been scored, however the net is not absolutely required.

2.6 Goal Complies with UEFA and FIFA Regulation

2.6.1 Aluminium soccer goal free-hanging net support: Made from special super-stable aluminium profile with high quality alloy. Size 732 x 244 cm (frame), 200 cm depth. Aluminium, for inserting into ground socket, with welded mitre joints. The upper net brackets are screwed on with 16 mm

stainless steel screws located in the profile. For back using galvanize steel posts with pulley and locking device (Ø 60 mm).

Figure 2.6.1: Aluminium Soccer Goal Free-Hanging Net Support

2.6.2 Aluminium leisure goal (with two holes): Super stable reinforced aluminium constructions, fully welded, rectangle 80 x 80 mm. Back and side bars made from turbular steel Ø 30 mm, so a net is not necessary (open to). 4 plates welded to the ground frame allow for safe ground anchoring.

Figure 2.6.2: Aluminium Leisure Goal (With Two Holes)

2.6.3 Aluminium soccer goal system 120 x 100 mm: Made from super special aluminium profile with high-quality alloy. Official size 732 x 244 cm. Complies with FIFA regulations. Top quality meeting highest demand of the professional league.

Figure 2.6.3: Aluminium Soccer Goal System 120 x 100 mm

2.6.4 Senior portable aluminium goal post wheels and handle: Made from special super-stable aluminium profile with high quality alloy. Size 732 x 244 cm (frame), 200 cm depth. Transport wheels for freestanding 120 x 100 mm soccer goals. Tyre wheels, diameter 20 cm. Easy attachment. Supplied in sets 8 (4 wheels per goal). The goal also has two large sides handle so it can be easily transported.

Figure 2.6.4: Senior Portable Aluminium Goal Post Wheels and Handle

2.6.5 Transport trolley for soccer goal: Large running wheels for ease transport. Made from high quality aluminium profile, simply fastened to the side of the base frame. With portable system, using 2 stainless steel screws diameter 10 mm. Wheels, diameter 20 cm easy attachment. Aluminium construction with large transport wheels for screw fastening to the front bar of the goal frame. Please specify the measurement of the existing goal frame when placing your order.